STATE OF SOUTH CAROLINA)

BEFORE THE PUBLIC SERVICE COMMISSION OF SOUTH CAROLINA

Application of

Duke Energy Carolinas, LLC for Approval of Energy Efficiency Plan Including an Energy Efficiency Rider and Portfolio of Energy Efficiency Programs.

COVER SHEET

DOCKET NUMBER: 2007-358-E

(Please type or print)

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DOCKETING INFORMATION (Check all that apply)

☐ **Emergency Relief demanded in petition** ☐ **Request for item to be placed on Commission's Agenda expeditiously**

☒ **Other:**

INDUSTRY (Check one)

- ☒ Electric
- ☐ Electric/Gas
- ☐ Electric/Telecommunications
- ☐ Electric/Water
- ☐ Electric/Water/Telecom.
- ☐ Electric/Water/Sewer
- ☐ Gas
- ☐ Railroad
- ☐ Sewer
- ☐ Telecommunications
- ☐ Transportation
- ☐ Water
- ☐ Water/Sewer
- ☐ Administrative Matter
- ☐ Other:

NATURE OF ACTION (Check all that apply)

- ☐ Affidavit
- ☐ Agreement
- ☐ Answer
- ☐ Appellate Review
- ☐ Application
- ☐ Brief
- ☐ Certificate
- ☐ Comments
- ☐ Complaint
- ☐ Consent Order
- ☐ Discovery
- ☐ Exhibit
- ☐ Expedited Consideration
- ☐ Interconnection Agreement
- ☐ Interconnection Amendment
- ☐ Late-Filed Exhibit
- ☐ Letter
- ☐ Memorandum
- ☒ Motion
- ☐ Objection
- ☐ Petition
- ☐ Petition for Reconsideration
- ☐ Petition for Rulemaking
- ☐ Petition for Rule to Show Cause
- ☐ Petition to Intervene
- ☐ Petition to Intervene Out of Time
- ☐ Prefiled Testimony
- ☐ Promotion
- ☐ Proposed Order
- ☐ Protest
- ☐ Publisher's Affidavit
- ☐ Report
- ☐ Request
- ☐ Request for Certificatio
- ☐ Request for Investigatior
- ☐ Resale Agreement
- ☐ Resale Amendment
- ☐ Reservation Letter
- ☐ Response
- ☐ Response to Discovery
- ☐ Return to Petition
- ☐ Stipulation
- ☐ Subpoena
- ☐ Tariff
- ☒ Other: Testimony of Janice D. Hager

BEFORE

THE PUBLIC SERVICE COMMISSION OF

SOUTH CAROLINA

DOCKET NO. 2007-358-E

In re: Application of Duke Energy Carolinas, LLC For Approval of Energy Efficiency Plan Including an Energy Efficiency Rider and Portfolio of Energy Efficiency Programs	))))))	**TESTIMONY OF JANICE D. HAGER FOR DUKE ENERGY CAROLINAS**

This document is an exact duplicate, with the exception of the form of the signature, of the e-filed copy submitted to the Commission in accordance with its electronic filing instructions.

I. INTRODUCTION AND PURPOSE

Q. PLEASE STATE YOUR NAME, ADDRESS AND POSITION WITH DUKE ENERGY CORPORATION.

A. My name is Janice D. Hager. My business address is 526 South Church Street, Charlotte, North Carolina. I am Managing Director, Integrated Resource Planning and Environmental Strategy for Duke Energy Corporation's ("Duke Energy") operating utilities, including Duke Energy Carolinas, LLC ("Duke Energy Carolinas" or the "Company"). I have held a number of different responsibilities in my 26 years at Duke Energy, including Vice President, Rates and Regulatory Affairs for Duke Energy Carolinas.

Q. WHAT ARE YOUR JOB RESPONSIBILITIES?

A. I have responsibility for integrated resource planning and environmental compliance planning for Duke Energy Corporation's regulated electric utilities. In that role, I have responsibility for the long-term resource planning for Duke Energy's Carolinas and Midwest operations, as well as planning for environmental compliance. Duke Energy's long-range resource planning process is conducted separately for each of the operating utilities.

Q. PLEASE SUMMARIZE YOUR EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE.

A. I am a civil engineer, having received a Bachelor of Science in Engineering from the University of North Carolina at Charlotte. I began my career at Duke Power Company in 1981 and have had a variety of responsibilities across the Company in areas of piping analyses, nuclear station modifications, new generation

licensing, rates, and regulatory affairs. I am a registered Professional Engineer in North Carolina and South Carolina.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE THIS COMMISSION?

A. Yes. I have testified before the Public Service Commission of South Carolina (the "Commission") on several prior occasions, including past annual fuel cost proceedings and a proceeding on the utility process for consideration of capacity alternatives.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to discuss the need for new capacity outlined in the Company's 2007 Integrated Resource Plan filed on November 15, 2007 in Docket No. 87 – 223 – E ("IRP" or the "Annual Plan") and how energy efficiency[1] is reflected in the integrated planning resource models.

II. CAPACITY NEEDS IDENTIFIED IN THE COMPANY'S ANNUAL PLAN

Q. PLEASE DESCRIBE THE PURPOSE OF COMPANY'S ANNUAL PLAN?

A. Duke Energy Carolinas' Annual Plan is developed with the objective of meeting customers' needs for a highly reliable energy supply at the lowest reasonable cost. Annually, Duke Energy Carolinas develops a resource plan for meeting customers' energy needs, which considers a combination of: (i) existing purchase power contracts, (ii) existing and new generation, and (iii) customer energy efficiency options. The Annual Plan is filed with the Commission and the North Carolina Utilities Commission on an annual basis.

[1] The term "energy efficiency," as used in this testimony, includes both energy efficiency/conservation and demand response measures.

Q. WHAT PROCESS DOES THE COMPANY USE TO FORECAST CAPACITY NEEDS IN ITS IRP?

A. The planning process considers a wide range of assumptions and uncertainties and develops an action plan that preserves the options necessary to meet customers' needs. Duke Energy Carolinas' resource planning process seeks to identify what actions the Company must take to ensure there is a safe, reliable, reasonably-priced supply of electricity regardless of how these uncertainties unfold.

The process begins with a forecast of customer needs. The 20-year forecast used for the 2007 IRP reflects a 1.6 percent average annual growth in summer peak demand, while winter peaks are forecasted to grow at an average annual rate of 1.4 percent. The forecasted growth for average annual territorial energy is 1.4 percent.

The next step is to gather information on Duke Energy Carolinas' existing resources. Duke Energy Carolinas' generation portfolio is composed of over 21,000 MWs of generation capacity, with about one-third of the capacity in coal-fired generation resources, one-third of the capacity in nuclear resources, and the other third in hydro-electric and gas-fired generation (of about equal proportions). In addition, as discussed in Company Witness Schultz's testimony, the Company has approximately 700 MWs of existing demand response programs that are roughly equivalent to peaking capacity.

Although Duke Energy Carolinas' capacity mix is approximately one-third coal, one-third nuclear, and one-third hydroelectric and gas-fired, the energy mix is approximately 50% nuclear and 50% coal-fired generation. Gas-fired

generation and hydroelectric generation provide only a small percentage of the current energy needs of the Duke Energy Carolinas' customers.

Q. PLEASE DESCRIBE HOW LOAD FORECASTS AND RESOURCE NEEDS ARE BALANCED IN THE IRP.

A. To meet the future needs of Duke Energy Carolinas' customers, it is necessary to understand the load and resource balance. For each year of the planning horizon, Duke Energy Carolinas develops a load forecast of energy sales and peak demand. To determine total resources needed, the Company considers the load obligation plus a target planning reserve margin, which is currently set at 17 percent. The capability of existing resources, including generating units, energy efficiency programs, and purchased power contracts, is measured against the total resource need. Any deficit in future years will be met by a mix of additional resources that reliably and cost-effectively meets the load obligation.

Hager Exhibit No. 1 shows the existing resources and resource requirements to meet the load obligation, plus the 17 percent target planning reserve margin. Beginning in 2007, existing resources, consisting of existing generation, energy efficiency, and purchased power to meet load requirements, total 21,330 MW. The load obligation plus the target planning reserve margin is 20,907 MW, indicating sufficient resources to meet Duke Energy Carolinas' obligation through 2008. The need for additional capacity, shown in the Table below, grows over time due to load growth, unit capacity adjustments, unit retirements, existing energy efficiency program reductions, and expirations of

purchased-power contracts. The need grows to approximately 6,600 MW by 2017 and to 10,700 MW by 2027 as shown in Table 1 below.

Table 1

Cumulative Resource Additions to Meet A 17 Percent Planning Reserve Margin

Year	Cumulative Capacity Additions Needed
2007	0
2008	60
2009	430
2010	990
2011	2,340
2012	3,190
2013	4,030
2014	4,630
2015	5,540
2016	6,090
2017	6,620
2018	7,020
2019	7,430
2020	7,880
2021	8,270
2022	8,670
2023	9,070
2024	9,470
2025	9,880
2026	10,280
2027	10,680

Q. DID DUKE ENERGY CAROLINAS PERFORM QUANTITATIVE ANALYSES IN THE RESOURCE PLANNING PROCESS?

A. Yes. Duke Energy Carolinas' resource planning process provides a framework for the Company to assess, analyze and implement a cost-effective approach to meet customers' growing energy needs reliably. In addition to assessing

qualitative factors, a quantitative assessment was conducted using a simulation model.

A variety of sensitivities and scenarios were tested against a base set of inputs for various resource mixes, allowing the Company to better understand how potentially different future operating environments such as fuel commodity price changes, environmental emission mandates, and structural regulatory requirements can affect resource choices, and, ultimately, the cost of electricity to customers.

Q. WHAT WERE THE RESULTS OF THE COMPANY'S QUANTITATIVE ANALYSES?

A. The quantitative analyses suggest that a combination of additional base load, intermediate, and peaking generation, renewable resources, and energy efficiency programs is required over the next twenty years to meet customer demand reliably and cost-effectively.

III. ENERGY EFFICIENCY IN THE COMPANY'S 2007 ANNUAL PLAN

Q. HOW WERE ENERGY EFFICIENCY PROGRAMS REFLECTED IN THE COMPANY'S 2007 ANNUAL PLAN?

A. The 2007 IRP reflects the impacts of the energy efficiency programs proposed in the Company's Application for Approval of Energy Efficiency Plan, Including an Energy Efficiency Rider and Portfolio of Energy Efficiency Programs (the "Application"), as well as additional impacts from currently unidentified sources. See Table 2 below for the projected impacts of the Company's energy efficiency efforts over the planning horizon.

Table 2

Projected Energy Efficiency Results in MW

Year	Total Conservation	Total DSM	Total MW Impacts
2008	40	761	801
2009	110	898	1,008
2010	175	1,016	1,190
2011	237	1,016	1,253
2012	302	1,016	1,318
2013	373	1,016	1,388
2014	437	1,016	1,453
2015	499	1,016	1,515
2016	565	1,016	1,581
2017	635	1,016	1,651
2018	700	1,016	1,716
2019	762	1,016	1,778
2020	789	1,016	1,805
2021	789	1,016	1,805
2022	789	1,016	1,805
2023	789	1,016	1,805
2024	789	1,016	1,805
2025	789	1,016	1,805
2026	789	1,016	1,805
2027	789	1,016	1,805

The impacts for the first four years are those reflected in the Application as shown on page 3 of the Application, with the exception that the Table in the Application includes projected accomplishments from the Advanced Power Manager pilot program. The projected accomplishments for the pilot program are too preliminary at this point to include them in the projected energy efficiency accomplishments for planning purposes. The accomplishments for this and other pilot programs will be incorporated into future plans once there is greater certainty of their likely impacts. The projected impacts for the remaining years were developed assuming the Company would continue to achieve energy efficiency at the same rate as the first four years for an additional eight years.

Q. WHAT COSTS WERE ASSUMED FOR THESE PROGRAMS IN THE 2007 IRP?

For program costs, Duke Energy Carolinas used the revenues that would be received under the proposed "save-a-watt" model to ensure that the programs were beneficial to customers (*i.e.*, that they were cost-effective when priced at the save-a-watt price).

Q. ARE THESE THE SAME COSTS USED IN THE SCREENING OF THE PROGRAMS AS DISCUSSED BY DR. STEVIE?

A. No. Dr. Stevie discusses how the programs are analyzed within the DSMore model and how the programs fare under various cost-effectiveness tests. Dr. Stevie uses the actual cost of the programs, as well as expected load impacts, to measure their cost-effectiveness. In contrast, for the IRP analysis, the projected revenues under Rider EE (SC) are used as program costs. This is appropriate because this is the cost customers will actually incur for the programs if the Commission approves the Company's Application.

Q. HOW DID THE PROPOSED SAVE-A-WATT PLAN FARE IN THE 2007 IRP ANALYSIS?

A. In the screening phase of the resource planning process, the model selected the energy efficiency options as shown on Table 2 above as part of the preferred resource portfolio under all proposed scenarios and sensitivities, indicating the energy efficiency resources are lower cost to customers than equivalent supply-side alternatives. This indicates that the proposed energy efficiency programs are part of the "optimum" resource plan. In the detailed analysis phase, portfolios

including the energy efficiency resources shown on Table 2 were lower cost to customers than those that included the Company's existing energy efficiency programs. As discussed by Company Witness Farmer, the revenue requirements have been updated since the Company filed its Application. An analysis of the updated costs continues to show energy efficiency as cost-effective for customers. In summary, the portfolios including the save-a-watt plan are lower cost to customers than alternative portfolios that do not include the proposed energy efficiency programs.

Q. HOW DO ENERGY EFFICIENCY PROGRAMS IMPACT THE COMPANY'S IRP?

A. Duke Energy Carolinas is projecting that energy efficiency will offset the need for generating resources that would have been required to meet customer needs by providing approximately 1805 MWs of capacity (replacing an existing 700 MWs) and over 2,000,000 MWHs of energy. If the implementation of the Company's save-a-watt plan yields the results projected in the 2007 Annual Plan, Duke Energy Carolinas will be able to avoid building at least one new 700 MW gas-fired plant and to defer two others by a year over the next ten years.

Q. ARE ENERGY EFFICIENCY PROGRAMS A RELIABLE SOURCE OF ENERGY AND CAPACITY?

A. They certainly can be. Duke Energy Carolinas has long relied upon DSM programs as an integral component of its resource mix. The current DSM programs provide approximately 700 MWs of capacity at the time of the system peak. These programs are tested periodically to ensure their availability, and the

results of activating the programs are studied following an event to determine if the expected results were achieved. History has shown that these programs can be counted upon as a reliable resource.

With regard to conservation programs, once conservation measures are installed they will likely be reliable resources as well. Conservation measures (*e.g.*, weatherization or high efficiency commercial lighting) are not subject to scheduled or forced outages. These measures, once implemented, will provide resources with measured reliability, such that prudent inclusion into the Duke Energy Carolinas' resource mix is possible.

One uncertainty, however, is the extent of customer participation in energy efficiency programs. In addition to the planned measurement and verification that will occur after the programs are implemented, the Company will be carefully monitoring programs during roll out and make adjustments to projected program results within the IRP process to ensure adequate reliable resources to meet customer needs.

Q. WHAT ASSURANCES DOES DUKE ENERGY CAROLINAS OFFER THAT CUSTOMERS ARE NOT PAYING FOR CAPACITY THAT IS NOT AVOIDED?

A. The save-a-watt model is fundamentally based on payment for results. If the Company estimates that we will achieve 500MW of energy efficiency and only achieves 300MW of savings, Duke Energy Carolinas will be compensated for the 300MW under Rider EE (SC). If the Company then has to secure 200MW of supply elsewhere, the Company would do so and reflect the costs of the capacity

as a cost of serving our customers. Upon approval, this would result in customers paying for 300MW of energy efficiency and 200MW of supply from another source. Customers will not have to pay for 500MW of energy efficiency programs, of which 200MW did not materialize, and then pay for the additional supply. Therefore, customers are only paying for the resources – be they energy efficiency or supply side – that the Company actually has acquired.

The Company will update at least annually the expected level of energy efficiency accomplishments. To the extent energy efficiency results are trending lower or higher than expected, the IRP process will incorporate these expectations and identify resources needed to reliably serve load.

IV. RETIREMENT OF OLD COAL PLANTS

Q. HOW DOES DUKE ENERGY CAROLINAS PLAN TO IMPLEMENT THE NORTH CAROLINA UTILITIES COMMISSION'S RECENT ORDER IN ITS CLIFFSIDE CPCN PROCEEDING REQUIRING RETIREMENT OF OLDER COAL PLANTS?

A. The North Carolina Utility Commission's order in March 2007 approving the Company's request for a Certificate of Public Convenience and Necessity ("CPCN") for a new 800 MW clean coal generating unit requires Duke Energy Carolinas to retire older coal-fired units (in addition to Cliffside Units 1 through 4) on a megawatt-for-megawatt basis to account for actual load reductions realized through new energy efficiency programs up to the megawatt level added upon completion of Cliffside Unit 6. Consequently, the Company will consider (i) the megawatt ("MW") capacity reflected in the energy efficiency programs, (ii)

the hours of availability over which the energy efficiency resource applies, (iii) the blend of supply side resources required going forward, including both capacity and energy components, (iv) the relative uncertainty of energy efficiency impact projections and impact evaluation findings, (v) the likely persistence of energy efficiency impacts over the planning horizon of the IRP, and (vi) the traditional set of planning criteria and reserve margin drivers, in arriving at the appropriate projection of MWs of capacity to be built, retired or avoided. As savings are verified, Duke Energy Carolinas will include projected retirement dates in the IRP filings which are subject to Commission review.

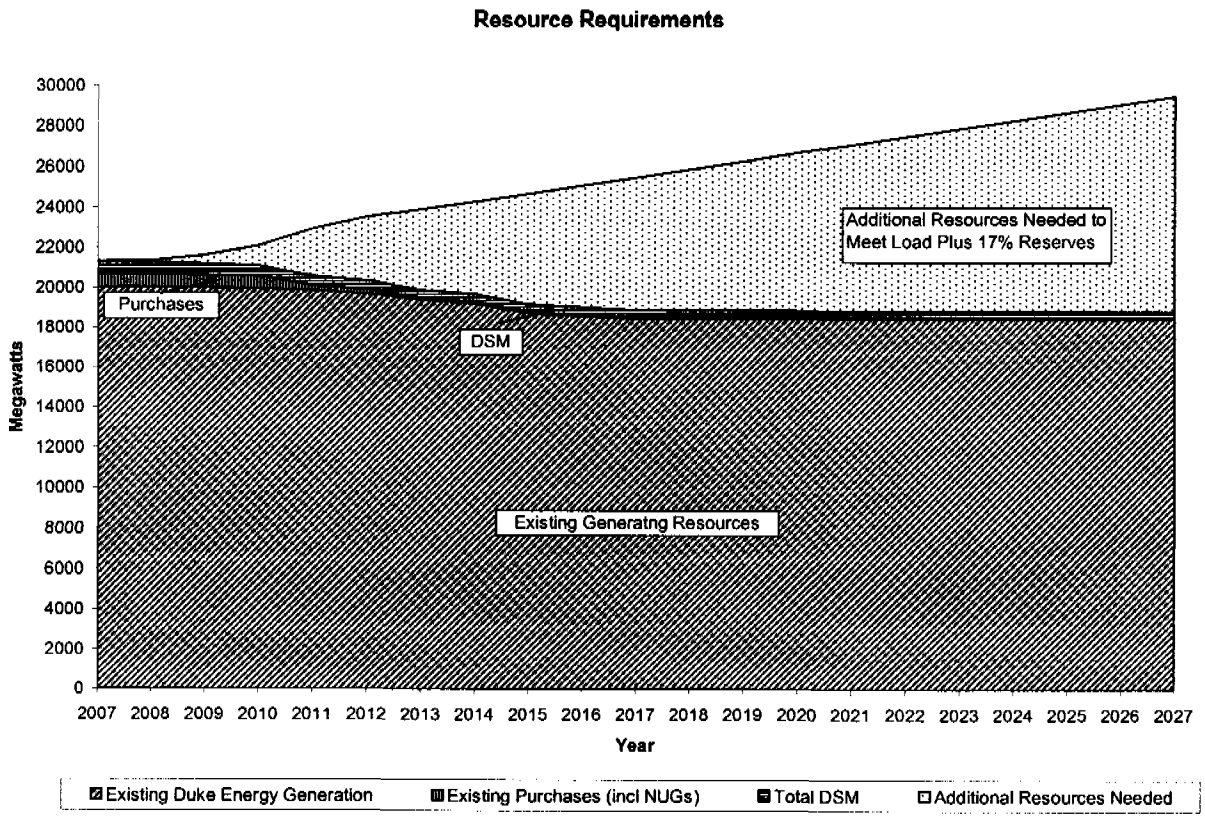
Q. WAS HAGER EXHIBIT NO. 1 PREPARED BY YOU OR UNDER YOUR SUPERVISION?

A. Yes.

Q. DOES THIS CONCLUDE YOUR PRE-FILED DIRECT TESTIMONY?

A. Yes.

Load and Resource Balance



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DOCKET NO. 2007-358-E

In Re:	)	
	)	
Application of Duke Energy Carolinas, LLC for Approval of Energy Efficiency Plan Including an Energy Efficiency Rider and Portfolio of Energy Efficiency Programs	)	**CERTIFICATE OF SERVICE**

This is to certify that I, Leslie L. Allen, a legal assistant with the law firm of Robinson, McFadden & Moore, P.C., have this day caused to be served upon the person(s) named below the **Testimony of Janice D. Hager** in the foregoing matter by placing a copy of same in the United States Mail, postage prepaid, in an envelope addressed as follows:

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Dated at Columbia, South Carolina this 10th day of December, 2007.

Leslie L. Allen